Presidents of the Royal Society. There certainly seems good grounds for the complaint that the Scottish expedition has not received its fair share of support from the Treasury. It will be lamentable if scientific results of such importance be still further delayed in publication, and it is to be hoped that the Government will give favourable consideration to this reasonable appeal.

NOTES.

We record with deep regret the death in Vienna, on April 25, at eighty-three years of age, of Prof. E. Suess, foreign member of the Royal Society, and emeritus professor of geology in the University of Vienna.

Mr. Herbert Samuel stated in the House of Commons on Tuesday that he is about to appoint a Committee to consider the question of smoke abatement. The names of the members will be announced in a few days.

The April number of *Science Progress* contains an editorial article of nine pages, entitled "Sweating the Scientist." During the past year an inquiry has been conducted by our contemporary as to the emoluments of scientific workers, and the article referred to is a provisional report on the results of this inquiry. As might, perhaps, have been anticipated, the replies received suffice to prove the "low scale of payment given throughout the British Empire for such work." This result is no doubt due to the law of supply and demand, and an interesting sketch is given of the conditions which give rise to such a state of affairs. Other grievances are also dealt with. "Besides the low rate of pay, there are, in this country at least, many small abuses attached to high intellectual work. Large portions of the income of many institutions are given to the maintenance of more or less useless pursuits. Originality and success in research do not receive their due place in selection for appointments. The best-paid posts are seldom given for the best work done, but rather for qualities which are of little account—popularity, eloquence, text-book knowledge, private influence, and skill in the arts of time service. We appear to judge men, not by the work which they have done, but by the work which we may imagine, from their appearance, that they may do." The lack of financial support afforded by the Government to the higher forms of intellectual effort and to higher education is also criticised. The article is a timely one, and deserves the careful attention of all scientific workers, as the question of remuneration is one of paramount importance to the future welfare of science in this country. Particular reference is made to the unpaid services of men of science upon Government Committees, and to the custom of Government departments going to learned societies for expert advice for which no payment is made. "In other words, the State exploits the man of science on account of his enthusiasm for his work and his patriotism." The whole subject is one which the British Science Guild could take up appropriately and refer to a committee.

Dr. Basil T. Parsons-Smith has been awarded the Hunterian Society's medal for his essay, "The Intermittent Pulse."

We learn from the *British Medical Journal* that sufficient funds have now been collected for the erection at Verona of a memorial to Prof. Cesare Lombroso. It is hoped that the monument (which will be the work of Leonardo Bistolfi) will be unveiled in 1915 at the time of the International Congress on Pellagra, which is to be held at Verona.

On Tuesday next, May 5, Prof. W. Bateson will deliver the first of two lectures at the Royal Institution on (1) double flowers, (2) the present state of evolutionary theory, and on Saturday, May 9, Prof. C. J. Patten, of Sheffield University, will begin a course of two lectures on bird migration. The Friday evening discourse on May 8 will be delivered by Prof. Karl Pearson on albinism in men and dogs, and on May 15 by Prof. F. Keeble on plant animals: a study in symbiosis.

The council of the Institution of Civil Engineers has made the following awards for papers read and discussed during the session 1913–14:—A Telford gold medal to Mr. F. W. Cowie (Montreal); a George Stephenson gold medal to Mr. F. E. Wentworth-Sheilds (Southampton); Watt gold medals to Mr. Thos. Clarkson (Chelmsford), and Mr. Henry Fowler (Derby); and Telford premiums to Prof. E. G Coker (London), Mr. W. A. Scoble (London), Mr. Wm. Willox (London), and Mr. S. P. W. D'Alte Sellon (London).

In the House of Commons on April 22, Mr. Astor directed attention to the unsatisfactory state of legislation and administration with reference to the supply and sale of milk and cream in the United Kingdom; and moved "That fresh legislation is needed to control the supply and sale of milk and cream in the United Kingdom, and that the existing laws should be more thoroughly administered." Mr. Herbert Samuel, in reply, stated that the Board of Agriculture is about to issue a new Order granting more generous compensation to the farmers for the cows slaughtered for the purpose of checking the spread of tuberculosis, and that local authorities are to be assisted in the administration of the law. He further stated that he hopes shortly to introduce a Milk and Dairies Bill, more restricted than its predecessors, which will substitute for various codes now administered by local authorities the uniform provisions of a general statute. He is anxious not to disturb the dairying industry, or to raise the price of milk, and the Bill will be framed in that spirit.

Final arrangements are now being made for the International Congress of Tropical Agriculture, which is to be held in London at the Imperial Institute in June next, under the presidency of Dr. Wyndham Dunstan. Invitations to take part in the congress have been issued to foreign countries by H.M. Secretary of State for Foreign Affairs, and already many foreign Governments have nominated delegates to represent them at the congress. The cooperation of many planters' associations, commercial museums, chambers of commerce, Colonial societies, and similar bodies in this country and abroad has also been secured, and it is already known that at least forty countries will be represented at the congress, ranging from our nearest neighbour France, to such remote places as Formosa, Hawaii, and Papua. A notable feature of the congress will be the organised discussions on certain questions of outstanding importance to tropical agriculture. Four of these have been arranged, viz., technical education in tropical agriculture; the organisation of tropical agricultural departments in relation to research work; the defects of plantation rubber and the means of avoiding them; and problems of cotton cultivation. The fact that the British Cotton Growing Association, the International Federation of Cotton Spinners, the Egyptian, Indian, Nyasaland, Uganda, and Nigerian Government Departments of Agriculture, and the German Colonial Economic Committee have each deputed officials to contribute papers in the discussion on problems of cotton cultivation, indicates the success attained by the organising committee for the congress in securing competent exponents of different points of view on these questions. Full particulars of these and other arrangements for the congress are given in the preliminary general circular and the members' circular, copies of which can be obtained on application to the congress secretaries (Dr. T. A. Henry and Mr. Harold Brown) at the Imperial Institute, London, S.W.

In the second part of *Ancient Egypt* Prof. Flinders Petrie, the editor, discusses the question of so-called "mummy wheat." At Hawara in the Fayum he discovered a large store of corn of the Roman period, some of which was sown, but failed to germinate. The "mummy wheat" legend is based on various accidents: some dealers in Thebes sell little pots of ordinary corn to tourists; Sir Joseph Hooker noticed accidental admixture of fresh raspberry seeds with some found in the Laurion Mine; there is, lastly, the desire of the gardener to make the experiment successful. Doubtless from time to time the story of the germination of "mummy wheat" will be told, and only credulous people will continue to believe it.

In the Museum Journal of the University of Pennsylvania for December last Dr. Edith H. Hall describes a fine collection of ancient glass, recently increased by numerous specimens from graves in Palestine and Italy. It includes fine examples of the primitive type, in which the decoration was achieved by laying threads of variously coloured glass over the surface of the vase while it was still hot, and then rolling the whole upon a smooth stone until the threads were pressed in. Besides these there is a good series of Roman mosaic glass, of which the best are the *millifiori* bowls, so called by the Venetians who valued them highly. The rapid increase of the art collections in this museum, due to the wise expenditure of its income and the munificence of American citizens, is noteworthy.

A large portion of the April number of the *Irish Naturalist* is devoted to a memoir, with portrait, of the late Major G. E. H. Barrett-Hamilton, by Mr. C B. Moffat.

To the first part of vol. xxxvi. of Notes from the Leyden Museum, Dr. J. H. Vernhout contributes an article on the land and fresh-water molluscs of Surinam, or Dutch Guiana, a subject which has hitherto received but scant attention at the hands of naturalists, the only complete list being one published by van Martens in 1873. Many new species are described in the part now issued.

At the conclusion of an article in the April number of the *American Naturalist*, by Dr. A. F. Shull, on the biology of the Thysanoptera (thrips, etc.), it is stated that *Anaphothrips striatus*, hitherto known almost exclusively by females, recently produced about 25 per cent. of males at Douglas Lake. This suggests that the theory of an alternating life-cycle in this and certain other members of the group, which was at one time formulated but subsequently rejected, may have some measure of justification.

In the February number of the *American Museum Journal* Dr. F. A. Lucas concludes his account of groups of animals in museums, with reproductions from photographs of a large number of the most striking examples selected from various American museums. Among these, the great albatross colony on Laysan Island in the State University of Iowa and the scene illustrating North American mammalian life in the museum of Kansas University are perhaps the most wonderful. Nothing approaching them is to be seen in any English museum.

The thorough and exhaustive manner in which the German Government explores its colonial possessions in Africa is well exemplified by *Ergänzungsheft*, No. 9*a*, of *Mitteilungen aus den Deutschen Schutzgebieten*, which is devoted to the topographical results of several exploring expeditions in the southern and eastern Cameruns, as well as of one in Togo. Members of the various exploring parties have contributed their own notes, well illustrated with photographs of scenery, these notes including remarks on the anthropology, zoology, and botany of the districts traversed.

With the view of improving the Zoological Gardens under his care at Giza, Egypt, Captain Stanley Flower made a tour of inspection of the establishments of a similar or kindred nature in India during 1913, the results of which are published, with a number of interesting illustrations, in a Report on a Zoological Mission to India, issued by the Ministry of Public Works, Egypt, as No. 26 of the Zoological Service Publications. The author observes that in every zoological garden visited in India there were features of interest, and in each there were new facts of menagerie-technique to be learnt. The gardens at Calcutta were notable for the extent of the collection, those at Trivandrum for the scientific method on which they are arranged, and those at Peshawar for the splendid condition of the animals.

Optimism pervades the report of the council of the Zoological Society for 1913, the total number of fellows and the income from their subscriptions continuing to show a steady increase, while the receipts for admission at the gates of the gardens were the highest on record. The year will be notable for the commencement of the "Mappin Terraces" in the gardens, now nearing completion, and also for the preparation and acceptance of a general plan, made under expert advice, for improvements in the arrangement of the gardens as a whole. These alterations, which have become imperative owing to the increasing popularity of the gardens, will involve the abolition of the old bear-terrace, which, although one of the landmarks of the gardens, is now hopelessly antiquated and out of date. It is satisfactory to learn that plans for new and up-to-date salt- and fresh-water aquaria are under consideration. Neither has the scientific side of the society's work been neglected, special attention being directed in the report to the society's share in the new mammal survey of British India, which has already resulted in the discovery of one new genus and several new species of rodents.

IN the twenty-seventh annual report of the Marine Biological Station at Port Erin, Prof. B. Moore and his co-workers have summarised important observations on the hydrogen-ion concentration of sea-water, determining its degree of alkalinity or acidity, which does not remain constant throughout the year but varies with the relative activities of vegetable and animal organisms, and acts as an index to these activities. There are two maxima of alkalinity corresponding to the two seasonal outbursts of diatoms. The change observed indicates a synthesis, at these seasons, of some tons per acre of sea-water of organic vegetable matter for the nutrition of the animals. The green plants or diatoms break up the bicarbonates present in sea-water and form organic compounds, the amount of the removal of the carbon dioxide being shown by the increase in alkalinity in the water. It is noteworthy that the spring increase in alkalinity is just of the grade formerly found to be most favourable to the rapidity of cleavage in the initial stages of development of the eggs of the sea-urchin (Echinus).

A RECENT issue of the *Naturwissenschaftliche Wochenschrift* (March 15, 1914) contains an article by Dr. F. Stellwaag, of Erlangen, in which he directs attention to the apparently contradictory results obtained by various observers who have experimented on the colour-sense of bees. Following the methods of Lord Avebury and of Forel, von Dobkiewicz came to the conclusion that bees are able to distinguish between colours, but are only attracted by them when they have learnt by experience to associate a given colour with the presence of honey. This he considers to accord with the fact remarked by Plateau that many colourless and inconspicuous flowers are eagerly sought after by bees, while many brightly-coloured flowers are unvisited by them. These results were to some extent confirmed by von Frisch, who concluded further that the colour-vision of bees must resemble that of "red-blind" men. Hess, however, disputes the conclusions of both preceding experimenters, and considers that bees show no indication of being otherwise than totally colour-blind. Stellwaag himself is of opinion that in all these experiments an important factor has been overlooked, viz. the condition of the bees with regard to the general supply of provender. When this is deficient, bees will seek it anywhere.

AN interesting paper has been issued by W. E. Castle and J. C. Phillips in Publication No. 195 of the Carnegie Institution of Washington (1914), on the effects of selection in modifying the pattern of piebald rats. The piebald or "hooded" pattern behaves as a Mendelian recessive to the self-coloured condition, but within the hooded class there is considerable variation in the extent of the coloured areas. The authors have made continuous selection experiments, both in the direction of greater and of less pigmentation, extending over thirteen generations and involving the breeding of some 25,000 rats. Although the hooded pattern behaves as a Mendelian unit, selection of either plus or minus variation brought about permanent changes extending far beyond the original variation of the race. In each generation the offspring of selected parents tended to regress towards the mean of the preceding generation, with the result that when, after several generations of selection, the selection was reversed, the regression was *away* from the original mean. But by continued reversed selection from a race which had become very divergent, the mean was brought back nearly to the original starting point. Results are described of crosses between extreme plus and minus strains, and between such strains and self-coloured types. An account is also given of an extreme variant which appeared as a mutation. The paper should be compared with the recent work of Hagedoorn (*Zeitsch. indukt. Abstam.*, xi., 1914, p. 145).

A DETAILED account of the twelve months' poultry laying competition at the Harper Adams Agricultural College is given in the report of the college for 1913. Upwards of six hundred birds were tested, the average egg production being 152 for the twelve months period. A comparison of the returns obtainable from one acre of grass land when stocked entirely with poultry and the same area used for milk production, shows that a much greater return per acre can be produced in the former case, these being respectively 41*l*. 13*s*. 4*d*. and 4*l*. 3*s*. 2½*d*. It must be borne in mind that, although the gross return per acre in the case of the poultry is so much greater than for cattle, the expenses, capital and depreciation of stock, would be correspondingly high. Unfortunately, there seem to be no available figures which might be utilised for purposes of comparison. That the possibilities of egg production on commercial lines are great cannot be denied, and the actual determination of these, and the factors which govern such production, should prove an interesting and profitable field for further investigation.

A REPORT on sugar cane experiments in the Leeward Islands which has just been published, contains a summary of the varietal trials and work on manuring conducted during the last few years. Of the varieties which have been under cultivation for some considerable time, and of which the relative merits and suita bility to various conditions are well appreciated and recognised, Sealy seedling and B 147 have attained considerable popularity, while the more recently introduced varieties, B 4,596 and B 1,528, are more prominent. The importance of incorporating with the soil a sufficiency of organic matter, either as pen-manure or green crops, is becoming more and more recognised, and the various bacterial changes concerned in the breakdown of these manures are discussed in this report in the light of recent investigations. The extreme rapidity with which such changes proceed in tropical climates is indicated by the fact that under favourable conditions the humus content of the soil may be decreased by as much as 25 per cent. in the space of six months.

Some interesting observations on the action of thunderstorms in giving rise to seiches have recently been made by Messrs. Okada, Fujiwhara, and Maeda (Proc. Tokyo Math. Phys. Soc., vol. vii., 1914, pp. 210–221). The measurements of the seiches were made with a Honda limnimeter on the shores of Lake Biwa in central Japan. The authors indicate as important causes of seiches during thunderstorms the accumulation of rain-water over a portion of the lake, the impulsive action of winds on the surface, and sudden changes of barometric pressure; and as subsidiary causes the impact of falling raindrops on the surface of the lake and the attraction of the electrified mass of thunderclouds. They examine in detail the effects of a heavy thunderstorm that swept over Lake Biwa on April 19, 1912, and estimate that the change of barometric pressure (2·7 mm.) would account for an amplitude of 6·6 cm. in the seiches, the rainfall (32 mm. in twenty minutes) for an amplitude of 6·1 cm., while the impulsive action of the wind may have contributed an amplitude of 4·5 cm. The sum of these amplitudes is 17·2 cm., which is very close to the total amplitude observed

The two last contributions to the geology of the Antarctic Expedition of the *Belgica* ("Expédition Antarctique Belge: Résultats du Voyage du s.y. *Belgica* en 1897, 1898, 1899; Zoologie, Tuniciers, Caducichordata," by Ed. van Beneden and Marc de Selys-Longchamps, 1913; and "Géologie, Petrographische untersuchungen der Gesteinsproben," part ii., by Dragomir Sistek, 1912) include the account of the tunicates and a further contribution to the description of the rocks collected. The memoir on the tunicates was begun by E. van Beneden, and after his death was continued and completed by M. Marc de Selys-Longchamps. The expedition obtained eight species, of which five are new and another is represented by a new variety. All the species collected have been described in elaborate detail; the memoir comprises 120 pages, and is illustrated by seventeen plates and some figures in the text. The classification adopted is that by Hartmeyer. The new contribution on the petrography of the expedition is a description by D. Sistek of the rocks collected in the Straits of Magellan and the Beagle Channel, which is on the southern side of Tierra del Fuego. The rocks are all igneous or metamorphic. The most varied collection, including granite, diorites, quartz-porphyries, andesite, diabase, basalt, gneiss, schists, and clay slate, was made at Cape Gregory in the Straits of Magellan. The crystalline schists include a varied series. The chief rocks are illustrated by a plate of microphotographs of unusual clearness.

An important by-product of the adjustment of the primary triangulation of the United States was the discussion of the deflections of the vertical and anomalies of gravity, by Mr. J. E. Hayford, on the hypothesis of isostatic compensation of inequalities of the earth's surface. In this way the discrepancies between the observed and the anticipated values of each was very largely reduced, but, whatever the precise form of hypothesis used, there still remained an average anomaly of gravity of not less than 0·020 dyne, which was attributed by Mr. Hayford to an imperfection of isostatic adjustment. Prof. G. K. Gilbert has taken up the subject in Professional Paper 85–C of the U.S. Geological Survey, and shows that the distribution of the anomalies of gravity does not indicate any relation to the leading features of geological structure, as would be expected if they were due to variation in the distribution of density, or imperfect isostatic adjustment, within the earth's crust. From this he concludes that they are due, at least in part, to variations in the nuclear portions of the earth, below the limits within which isostatic adjustment, and compensation of elevated tracts of the earth's surface, take place.

Prof. G. A. Gibson, of Glasgow, has issued in separate pamphlet form the address he recently gave before the Royal Philosophical Society of Glasgow on Napier and the invention of logarithms. The pamphlet contains a clear picture of the career and personality of the great Scottish mathematician, bringing together within the compass of twenty-four pages the salient facts of his life. The interest for the mathematical student is the account given of the way in which Napier originally defined the logarithm. This does not correspond exactly with what is known as the Napierian logarithm, although it is closely related to it. There is a passing reference to Bürgi, whose "Progress Tabulen" has probably been seen by very few mathematicians in this country. The evidence that Napier was in possession of his method at least twenty years before he published his tables is also referred to; and Napier's other mathematical and arithmetical discoveries have as adequate a notice as is possible in such a brief statement. Prof. Gibson's sketch comes at an opportune time when mathematicians are preparing to celebrate the tercentenary of the publication of the "Canon mirificus logarithmorum."

A paper by Messrs. K. M. Faye-Hansen and J. S. Peck, published in the last issue of the Journal of the Institution of Electrical Engineers, deals with some interesting uses of inductance coils or "reactances" in heavy electrical engineering. These are being used to an increasing extent on large power supply systems of the order of 100,000 kilowatts for the purpose of limiting the current that may flow in various parts of the circuits in cases of accidental short circuits with the view of localising the damage that can be done. For example, it is possible by placing reactances in the conductors between the generators and the switchboard, to limit the current under conditions of short circuit on the switchboard or feeders to, say eight times, the normal working current, and thus to protect the machines from enormously greater rushes of current that would be destructive. The paper discusses the relative utility of such reactances in the generator leads, in the feeders, and between different sections of the main "bus-bars," and suggests various combined arrangements. These reactances generally take the form of large coils without iron in their magnetic circuit, but a partial iron circuit is sometimes employed. An appendix discusses the effect of bus-bar reactance on the parallel operation of alternators.

IN twelve pages of the March number of the Journal of the Franklin Institute Mr. W. P. Davey, of the X-ray laboratory, Cornell University, succeeds in giving a most valuable summary of the present state of our knowledge of Röntgen, or X-rays. After explaining the production of Röntgen rays by the impact of kathode rays on the target of a vacuum tube, he shows that they produce fluorescence in certain bodies on which they impinge, they affect photographic plates and ionise the air through which they pass. In each case the laws which have been found to hold are stated. When the rays fall on metals or on metallic salts they produce in certain cases secondary radiations which differ in properties from the original rays, and by analogy have been called fluorescent Röntgen or X-radiations. The methods adopted for the measurement of the quality or penetrating power of the radiations, and the quantity of radiation which falls on a given surface in a given time, are also described. The article will prove of great value to those who wish to make themselves acquainted with the principal facts of the subject without entering into details.

THE Société de Chimie-Physique has issued two more numbers of its series of monographs. These are vii., "Paramagnetism Applied to the Study of Metallic Salts," by Mlle. E. Feytis; viii., "Relations between Chemical Constitution and the Coloration of Organic Substances," by M. André Meyer. The latter contains, in addition to a review of the chief types of coloured compounds, a bibliography of the subject extending over ten pages, and containing more than two hundred references to original papers.

AN interesting illustrated article on charcoal burning in the Weald, by Mr. W. R. Butterfield, is contained in the April number of the *Selborne Magazine*. This primitive industry is still carried on in the Weald, although it has declined considerably during the last thirty years, owing to the decreased quantity of home-grown hops, for the drying of which the charcoal is mainly used. All the charcoal that is required is made during the few weeks before hop-picking, and the "collier," as the burner is called, and his mate move from farm to farm as required, and cover a wide area each season. The burners depend wholly upon empirical knowledge, either acquired by their own experience or handed on to them by their predecessors, and the operation is one requiring considerable skill and unremitting vigilance day and night.

THERE is an interesting illustrated article in the *Engineering Magazine* for April, giving an account of the workshops and methods of the Ford Motor Company. This company turns out 1000 automobiles a day at its Highland Park Works in Detroit. The other two factories belonging to the company, one at Ford, Ontario, Canada, and one at Manchester, England, bring the total Ford car-producing capacity to at least 1200 cars a day. The company produces one article only, viz., the Ford motor-car, and employs rather more than 15,000 hands.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES FOR MAY:—

May 1. 11h. 24m. Neptune in conjunction with the Moon (Neptune 4° 17′ S.).
,, 20h. 43m. Mars in conjunction with the Moon (Mars 1° 37′ S.).
15. 7h. 4m. Uranus in conjunction with the Moon (Uranus 2° 3′ N.).
16. 1h. 50m. Jupiter in conjunction with the Moon (Jupiter 1° 13′ N.).
,, 2h. 7m. Venus in conjunction with Saturn (Venus 2° 10′ N.).
,, 20h. 0m. Uranus stationary.
,, 23h. 0m. Mercury in superior conjunction with the Sun.
25. 23h. 5m Saturn in conjunction with the Moon (Saturn 6° 9′ S.).
26. 21h. 2m. Venus in conjunction with the Moon (Venus 3° 21′ S.).
28. 17h. 57m. Neptune in conjunction with the Moon (Neptune 4° 1′ S.).
30. 5h. 16m. Mars in conjunction with the Moon (Mars 0° 42′ S.).
,, 10h. 0m. Mercury at greatest heliocentric latitude N.

COMET 1914A (KRITZINGER).—Recent observed positions of comet 1914*a* (Kritzinger) have enabled Prof. Kobold (*Astronomische Nachrichten*, No. 4729) to improve the elements of this comet, and consequently the ephemeris. The new positions for the current week are now as follows:—

12*h*. *Berlin M.T.*

	R.A. h. m. s.	Decl. °	Mag.
April 30	18 13 21	+16 30·7	8·6
May 1	17 56	17 31·9	
2	22 34	18 32·8	
3	27 14	19 33·3	
4	31 55	20 33·3	
5	36 39	21 32·6	
6	41 23	22 31·2	
7	18 46 9	+23 29·0	8·5

The comet is situated in that portion of the constellation of Hercules lying to the south of Vega, and it will be noticed that the present calculation makes the object brighter by more than half a magnitude than that previously given.

THE APRIL METEORIC SHOWER.—Mr. W. F. Denning writes:—More favourable weather for meteoric observations could scarcely have occurred at the period of the Lyrid meteors. At Bristol the fourteen successive nights from April 10 to 23 were clear or generally